

with the American. The general superintendent, Mr. Young, was decidedly in favor of the English. He thought the looms did far more work, could be run at higher speed, and the spindles would do just as much. He did not believe in the ring-traveler, but would stick to the old English throstle. I asked the foreman of the spinning rooms his opinion. He said the American ring-traveler would do nearly or quite one fifth more than the throstle, but for high numbers of yarns the throstle did best.

Mr. Young gave me a history of his experience in cotton manufacturing in Georgia. He said years ago while he was keeping a country store, a man came along with a wagon-load of spun yards and wanted to sell it to him. "Why, I told him, the country people wouldn't buy his factory-made thread—every woman in the country had a spinning wheel. He insisted on leaving it with me, and said if I did not sell it he would take it back. Three months after he came along, and I had not only sold all but needed more. That was about the first factory-spun yarn sold in Georgia." Previous to the war there were thirty-three cotton and woolen factories in the State; now there are twenty-five—some not rebuilt.

In the loom rooms, I was told, they could get 50 yards per day from the English loom, and about 40 from the American. The American spindle, running on ordinary yarns, made from 5 to 5½, the English 4 to 4½ ounces of yarn per spindle per day.

This factory uses a little over 3,000 bales of cotton a year and nearly 200,000 pounds of wool. The wool is almost entirely drawn from So. W. Georgia. Their cotton blankets are a specialty and peculiar to them in this country; they get their idea from France. The factory was erected by Capt. U. J. McAllister, who has made many improvements in machinery, and, as he told me, always got them patented through the Scientific American Patent Agency.

These mills are an example of what the people of the South can do if they choose. They have a capital all paid in of \$1,250,000, of which only \$125,000 is from the North. Mill No. 1 paid a dividend of 18 per cent in 1868; in 1869, mill No. 2 was commenced, and has but lately been finished and filled with machinery. Two mills located here were burned during the war. The Company own other fine water powers, and with the same enterprise may treble their capacity.

Columbus is destined to be the great manufacturing place of the South. There is no such water power elsewhere, and nowhere else such ease of transportation. Then, too, it is in the midst of a fine cotton-growing region, and shipped last year over 75,000 bales of cotton. I asked the cost of manufacturing here compared with the North, but did not get a satisfactory answer. It was evident they did not desire to tell. Yet there is at least the difference in the price of cotton, and the difference of transportation and cheaper labor. In a pamphlet issued by General Chilton, he claims that it costs \$22 more to manufacture 500 pounds of cotton in Massachusetts than at Columbus—all charges and freights included. Labor is abundant, there being hundreds of poor whites anxious to get such work. General Chilton told me he had to turn them off daily.

There are three more cotton factories in the adjoining county of Upson, running about 7,000 spindles in all. In Columbus there are two large foundries and machine shops, and one agricultural implement manufactory; also near by, is Ennis' Novelty Wood Works, for spokes, hubs, etc., and patent wheelbarrows.

A railroad in Alabama will soon connect the town with the Alabama coal fields, and another southwards to Bainbridge, will give rapid and better communication to Savannah via A. & G. R. R.

Coal is now brought from Tennessee. The town is supplied with gas made from wood. It has no water works, but John E. Birkenbine, of Philadelphia, was there to examine localities, and report on the possibility of erecting suitable works. It is one of the needs of the place, especially as it will have a large manufacturing population, and should be well supplied with water. Good water can readily be had from the hill north of the town. H. E. C.

Nerve Telegraphs.

Within the flesh or muscular part of the body are two distinct sets of nerves, namely, the motor and the sensory nerves. By the sensory nerves the brain receives intelligence of all outward actions, and the mind becomes conscious of external things, such as light, scent, sound, taste, and touch, of pain or pleasure. The motor nerves, on the other hand, convey the intelligence or will of the mind from the brain to the outward world, by directing the muscular motion. If the brain desires the hand to strike the strings of a harp, it does so by the motor nerves; but the sound which is returned is conveyed to the brain by the sensory nerves. Intelligence from the brain to any part of the body, and conversely, is conveyed by the nerves at a velocity of 112 feet per second; that is, at a speed of one mile in 47 seconds. Quick as this may appear, the time between a wound given and the pain felt is appreciated. By what means the mind or will acts over the nerves we are unable to say. Persons who have what is figuratively termed "an iron will" can endure pain with almost stoic indifference. Neither tears nor laughter seem to move them. Others there are who have so little command over their nerves that trivial things affect them greatly. To train the mind to exercise its will over the nervous system is highly beneficial.—S. Piessé.

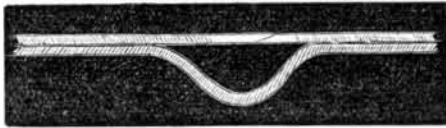
Fire-Arms in Turkey.

The *Levant Herald* says the Porte has decided upon converting a large number of the Springfield and Enfield rifles into Remingtons, and several thousand breech-pieces on this

latter system have been purchased in Vienna. As soon as the conversion has been effected the new arms will be served out to portions of various regiments with a view to test their practical value on a large scale. The military and naval preparations are being pushed on at Tophaneh, Zeitoun-bournou, and in the arsenal, in all three of which large numbers of hands are working extra time. In addition to the arms and munitions which are being rapidly manufactured in these establishments, a considerable contract for cannon on Krupp's system has been given to a house in Vienna, whence several batteries of mitrailleuses have also been ordered, in addition to those already purchased in Belgium and America.

RAZING BAND SAWS.

A correspondent of the *English Mechanic*, gives the following directions for brazing band saws: 1. Make a splice with a file on flat way of saw, the length of two teeth. 2. Get a



piece of flat iron, and bend it into the same shape as in the diagram, and with some small binding wire bind the saw perfectly straight and firm to the flat iron, so that the splice may come directly over the curve. 3. Wet the splice with clean water and rub on some powdered borax. 4. Make a stiff paste with spelter and borax mixed with water. Take a piece the size of a small nut and lay on top of splice. Put the splice between two pieces of charcoal and with a blow-pipe direct a steady flame from a gas-jet on the paste.

TAX OF TRANSPORTATION.—The country that exports the commodity of smallest bulk, is almost wholly freed from the exhausting tax of transportation. At Havre—ships being little needed for the outward voyage, while ships abound—the outward freights must be always very low. France, in 1856, exported silks and cloths, clothing, paper, and articles of furniture, to the extent of \$300,000,000; and yet the total weight was short of fifty thousand tons—requiring for its transport but forty ships of moderate size, and the services of perhaps two thousand persons.—Carey.

TRADE-MARKS AND DESIGNS.—Some of our prominent manufacturers have just discovered the existence of the new law, which authorizes foreigners to patent their trade-marks and designs, and find that it will seriously cripple their right to continue the practice of copying designs of foreign carpets, delaines, and other stuff goods. We are assured that a powerful effort will be made at the next session of Congress to repeal this law; therefore it behooves those who wish to protect their designs to do so at once. If the law should be repealed it cannot affect existing design and trade-mark patents.

EXTENSIVE SALT DEPOSIT NEAR BERLIN.—The boring at Sperenberg, near the city of Berlin, about twenty-five miles to the south, had reached, on the first of June last, a depth of 3,090 feet, and for 2,810 feet is through a bed of rock salt. How much deeper the deposit is remains to be tested by further boring. The deposit appears to be quite as rich as the famous Stassfurt mines.

The only shot tower in New England is, it is said, at Newport. This tower is 150 feet high. The lead is melted at the top of the tower and falls through sieves, cooling in drops of different sizes as it falls, which are caught by sieves of different sizes, and thus sorted for use.

THERE are now ten establishments in Missouri engaged in making pig iron, with a capacity of making 300 tons of iron per day. Four of these establishments are situated in South St. Louis, three near the line of the South Pacific Railroad, and the remainder on the line of the Iron Mountain Railroad.

QUERIES.

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers, and hope to be able to make this column of inquiries and answers a popular and useful feature of the paper.]

1.—**IRON CASTINGS.**—I have a difficulty to get my iron castings solid on the side which is uppermost in casting; would some brother molder give me a little advice as to the cause and remedy, and oblige?—A Young Molder.

2.—**BLACK JAPAN.**—Can you inform me how the pitch is prepared that is used in making black japan, and also how the japan is made, so that when put on a coach panel and varnished it does not turn green?—H. W. R.

3.—**WATER COLORS.**—Will some reader inform me how the liquid water colors in bottles are made; also how the moist water colors in pans are made?—W. C. C.

4.—**POWER OF ENGINE.**—Would any reader let me know, through the medium of your journal, the pressure necessary to drive a fourteen-horse-power high-pressure engine to work at its nominal power and how many revolutions per minute should it go?—J. B.

5.—**LACKERS.**—Will some obliging reader who is acquainted with lackering give me the recipes for making a good gold lacker, a good green lacker for bronzing, and a pale, colorless lacker?—Indicator.

6.—**SILVERING CHEAP LOOKING LOOKING-GLASSES.**—Can any of your readers tell me the way to silver cheap looking-glasses? also the materials required, and method of using? Having some pieces of glass that I want silvered for a particular purpose I should like to try and do it myself.—A. M.

7.—**CHEMICAL AND BREWING.**—The water I use for brewing contains a large quantity of iron. How can I get rid of this iron in the water? It prevents the beer getting bright. Would a filter of animal charcoal, vegetable charcoal, and gypsum do? I want some sort of filter which will extract the iron without damaging the water in other respects.—Brewer.

8.—**REMOVING PAINT AND TAR.**—How can I remove oil paint and tar from oil-cloths, tarpaulins, and other fabrics, so as to obtain the body cloth intact? Can some kind reader oblige?—Old Tar.

9.—**THE BIRD AND THE BAT.**—Will any of your readers inform me of the mechanical principles involved in the flight of the bird and the bat, and also wherein the difference between the two modes consists, or refer me to any work in which I might find such information.—T. R.

10.—**WHITE LIGHT.**—I am greatly in need of an artificial white light, one by which I can distinguish shades of color; not required to be intense but regular, and moderate in cost first and second. Is there any plan of taking the yellow out of gas or any other artificial light? I have tried tinted glasses for correction, but they do not answer.—J. O. R.

11.—**CONTRACTION AND EXPANSION OF METALS.**—If iron be heated and plunged into cold water it becomes hard and contracts, but if copper be heated and plunged into cold water it becomes soft. How is this accounted for? It seems a contradiction of the general law, viz., that all bodies expand by heat and contract by cold.—A. C. S.

12.—**SOLDERING BRASS TUBES.**—Will some reader tell me how to join thin brass tubes without the application of heat?—W. H. D.

13.—**DRY COLORS.**—I should feel obliged if some of your subscribers will inform me how to make dry colors, such as greens and blues, etc., or name a work which will give the information; also the best work on varnish making.—H. J. D.

14.—**A COTTON SPINNER'S DIFFICULTY.**—Would any of your readers in the cotton district help a brother spinner out of a difficulty? I have to work a double beater scutcher, and the cotton will stick to the last beater blades, and when it gets on to one side takes all the draft from the other, and so causes one part to choke and make a bad lap. I know there are plenty of books giving instructions as to calculations, but every one who is in the trade knows that to be a very small part of cotton spinning.—Workman.

15.—**DRY PLATE PROCESS.**—Will some photographic reader furnish me with the formula and manipulation of one of the best dry plate processes for a novice in the art to commence with?—A Would-be Photographer.

16.—**ENGINEERING ESTABLISHMENTS.**—Will some subscriber please state what engineering works employ the largest number of hands, and state the number of hands employed by several of the largest works in the world?—Draftsman.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address correspondents by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at \$1.00 a line, under the head of "Business and Personal."

All reference to back numbers should be by volume and page.

W. R. J. answers the inquiry of I. D., in regard to coloring butter, and preserving eggs. He recommends for coloring butter the juice of fresh carrots, or annatto, but gives no definite directions for the use of these materials. He says eggs may be kept by packing them in salt or bran point downward. He further says W. H. L. can get rid of red ants by sprinkling sugar on a coarse or very porous sponge. The ants will enter the cavities of the sponge to get the sugar, and being thus trapped they may be killed by immersing the sponge in hot water. The sponge may be used repeatedly in this way till the pests are removed. The more sponges used the more rapid will the extermination proceed. M. W., of Passaic, N. J., also recommends this plan.

Dr. T. A. H., of Ill., says red ants will not frequent a place where heavy coal oil has been smeared. A ring of this substance placed around a sugar barrel will, he says, protect the contents from the ants. Will he tell us whether the odor will not impregnate the sugar? He also recommends the method for keeping eggs given by W. K. J., of Illinois, but adds that it is important to keep them where the temperature does not rise above 50° nor fall lower than 32°.

R. L. C., of W. Va.—Birdlime may be made by boiling linseed oil over a slow fire till it is very thick and glutinous. Its adhesiveness may be proved by trial with the fingers. You will need to use much care not to burn it, and the vessel employed should not be more than one third full of oil. When sufficiently boiled pour it out into cold water. It is considered best to make it thicker than is actually necessary for use, and to bring it back to the proper consistency by mixing it with pine tar.

A. D. G., of Mass.—The theory in regard to the effect on health of the evaporation of water on heaters and stoves, is that the capacity of air to hold moisture is increased by heat, and that if not supplied in the manner alluded to it will seize moisture from the mucus membranes of the nose, throat, and lungs, irritating them, and rendering them unhealthy and susceptible to effect of atmospheric changes.

E. B., of Ill., says red ants may be exterminated by using a solution of one tablespoonful of tartar emetic in a pint of water. This placed where the ants can get it will, he says, prevent all further annoyance from them. Tartar emetic is, however, a deadly poison, and should, if used at all, be used with extreme caution.

G. R., of Mo.—The dark color of the steam escaping from the safety-valve of the boiler of which you speak, was probably due to the violent priming of the boiler. It is obviously impossible to give an intelligent opinion as to the primary cause of the explosion, without a personal inspection of the boiler, and full knowledge of the attendant circumstances.

E. G. P., of Mass., replies to R. L., of La., that he finds no better recipe for welding steel, than extensive careful practice. With that and a clean slow fire, and a liberal amount of borax, he finds no difficulty in welding steel to steel though it be hard and "rich in carbon."

W. H. A., of Tenn.—To join together pieces of tortoise shell, dress down the edges to a nice, true bevel, then lap them together and press them between hot iron plates. In practical working, tongs with long flat jaws are used for this purpose.

H. F., of Conn.—Rules for calculating diameters of speed pulleys are given in Fairbairn's "Mechanism and Machinery of Transmission," published by Henry Carey Baird, 406 Walnut Street, Philadelphia.

S. P., of N. Y.—After oil cloth has been well washed and is quite dry from water, it should be brushed over with beeswax, very slightly moistened with turpentine, then well polished with a polishing brush. Don't use soap and water—soap dissolves the oil.

J. A. C., of Md.—In our opinion borax and sal ammoniac constitute as good a flux in welding steel as any of the vended receipts.

J. H. E., of Iowa.—Our files contain all the information you seek on the subject of stained glass. We do not wish to repeat what we have said on this subject at present.

N. L., of N. Y.—No valuable information is conveyed in your article upon astronomy, therefore we cannot publish it.

W. M. W., of Ohio, wishes to know if cast iron can be hardened so as to retain its hardness after he ti